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Writing a Medical Master's Thesis Paper

Writing a thesis paper may be part of your Master's degree requirement for a medical college program. Writing a thesis paper can be a daunting task, especially if you have never written a college paper before. There are many misconceptions students have when writing a thesis paper. A thesis paper is **not**:

- An extensive report or revision of published literature.
- A summary of the facts or findings of a single article or different published sources.
- An entire collection of multiple quotations of published work from different sources.
- Based on unsubstantiated or controversial personal opinions or biases alone.

A thesis paper presents an issue and how you feel about that issue. The issue is defended by stating your own opinion in your own words. This makes the thesis paper original and one of a kind. It is your own creation based on your synthesis, analysis and evaluation (Blooms' Taxonomy levels of learning) of peer-reviewed evidence based data or facts. ^[1] Peer-reviewed evidence based data or facts help support your opinion or take a stand on the issue on your thesis paper. You **must** properly reference and cite all peer-reviewed evidence based data or facts to avoid plagiarism in your thesis paper.

Peer-reviewed evidence based data or facts help define the type of research your thesis paper is going to be about. There are three different types of research that can be used for a medical thesis paper: meta-analysis, comparison & contrast or clinical-case. Each type of research is unique and has a different set of requirements.

Meta-analysis is "a quantitative method of combining the results of independent studies (usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc., with application chiefly in the areas of research and medicine."^[2] Meta-analysis defines a hypothesis or problem about clinical laboratory tests or therapeutic drugs. It requires

the collection of various sets of numerical data and results from clinical laboratory tests or human clinical trials. For meta-analysis, the supportive numerical data and results **must meet three specific criteria**:

1. Data was collected using similar research methodology or procedures.
2. Experiments performed were controlled, accurate and reliable.
3. Data and results are complete and free of personal errors or biases.

The supportive numerical data and results are then mathematically analyzed to validate or confirm the conclusions in support of the hypothesis or problem.

Comparison & contrast presents the benefits, improvements or reliability of two new discoveries in the prevention, diagnosis **or** treatment of a particular condition or disease. Comparison & contrast compares feature by feature the two new discoveries. It also evaluates the risks and benefits associated with the two new discoveries. Comparison & contrast:

- Determines which of the two new discoveries is useful or has a better application in the medical field
- Justifies why this new discovery is a better alternative or option in the prevention, diagnosis **or** treatment of a specific condition or disease.

A clinical-case aims to analyze and make improvements in patient care or medical practice. This is also known evidence-based medicine or as the acronym PICO.^[3] The PICO model has four distinct categories: problem/disorder, intervention, comparison and outcome.^[4] Each category has a defined purpose:

1. The problem/disorder describes a particular disease or condition common to a patient population.
2. Intervention focuses on new changes, improvements **or** regulations in the management, diagnosis **or** treatment of the chosen disease or condition.
3. Comparison compares feature by feature and outweighs the risks and benefits of the new change, improvement **or** regulation against a current practice/standard.

4. The outcome determines and defends the benefits and results seen from the intervention.

Knowing which type of research interests you helps narrow the topic and decide which type of published peer-reviewed evidence based data or facts must be collected to support your opinion.

References:

1. Truman State University. [Levels of Learning: Bloom's Taxonomy in Action](#). Retrieved on 2011-08-05
2. National Library of Medicine. [Meta-analysis](#). Retrieved on 2011-08-02.
3. Thomas Jefferson University. [Evidence-Based Medicine: The Well-Built Clinical Question](#). Retrieved on 2011-08-05
4. University of Medicine and Dentistry of New Jersey-Camden. [Evidence-Based Medicine: The PICO Model](#). Retrieved on 2011-08-05

The Beginnings of Writing a Thesis Paper for a Medical Master's Program

Writing a thesis paper is a long and complex process. You will have to go through several stages to produce a final draft. The following eleven steps will be discussed through a series of articles to help you develop a medical Master's thesis paper:

1. What is the purpose of the thesis paper?
2. Who is your target audience?
3. Choose a topic
4. Search and collect peer-reviewed evidence based data
5. Synthesize, analyze and evaluate (Blooms' Taxonomy levels of learning) collected literature
6. Define the approach of the Master's thesis paper
7. Develop a thesis statement
8. Outline the body of the thesis paper using logical critical thinking
9. Write the first draft
10. Revise the first draft
11. Final Draft

The Purpose of your Thesis Paper

The purpose of a thesis paper explores the reasons why you are writing this paper and what you hope to accomplish in the end. The purpose of your Master's thesis paper can:

- Be educational
- Provide insights to new developments or discoveries in the medical field
- Aim to improve the quality of patient health care
- Recommend better alternatives for the prevention, management, detection and treatment of specific diseases or conditions
- Make contributions to patient care in combat theaters or has applications in specific military missions

Your Target Audience

Your target audience are the people who will read your paper. By knowing who your target audience is, you have an idea about what their background might be and how to tailor the content and language of your Master's thesis paper. It can also help you narrow down a general topic into a specific subject. The specific subject should be relevant to your target audience interests or to build their knowledge.

In a graduate program, your primary target audience will be your counselor or professors, medical or scientific professionals. Anyone involved in the final grading of your Master's thesis paper is considered your primary target audience.

The Master's thesis paper can also be submitted for publication in professional organization journals. For example, two professional organization journals for physician assistants are:

1. Advance for Nurse Practitioners & Physician Assistants (<http://nurse-practitioners-and-physician-assistants.advanceweb.com/Editorial/Content/editorial.aspx?CTIID=3950>)

2. Journal of the American Academy of Physician Assistants (<http://www.jaapa.com/jaapa-submission-guidelines/section/508/>)

These professional organization journals accept papers from both students and licensed professionals. Writing articles for publication will be part of your professional medical career. Click on the links above to see what their requirements are for submission of research or Master's thesis papers. If you are interested in publishing your Master's thesis paper, please discuss it with your counselor or professors.

When the Master's thesis paper is published in professional journals or online, your primary target audience can be any medical or scientific professionals or patients searching for a concrete diagnosis or alternative treatments.

Choosing a Topic

The topic that you choose must be in the general field of medicine. The topic:

- Must be about something you are interested in
- Has medical value or applications in the medical field
- Is new and innovative rather than overstated
- Requires hard work to develop over a period of time
- Teaches you something new and now you transmit your findings to others
- Builds knowledge or engages the interest of your target audience
- Is manageable and can be narrowed down into a specific subject
- Has plenty of peer-reviewed evidence based data or findings available
- Allows you to make your own interpretations and judgments (synthesis, analysis and evaluation) about an issue

When Should I Consider Changing my Topic?

As you research or begin to analyze literature sources, you may find out that the chosen topic is not ideal. Consider changing your topic when:

1. There are **no** sources or **only one** single source of published literature.
2. The topic does not meet the expectations of your target audience.
3. The topic has no significant medical value to your target audience.
4. The topic cannot be narrowed down to a specific subject.
5. You have no interest in or are bored by the topic.
6. The topic is too neutral to express your own interpretations and judgments (synthesis, analysis and evaluation) or leads to conclusions that have no medical value or significance.
7. The topic has already been published by others.
 - a. Summarizing or reporting published work done by others as your own original work is *plagiarism*. To avoid plagiarism, use those published sources as supporting data to explore a different aspect of the same topic.
 - b. For example, there are many peer-reviewed publications about using drug X for the prevention of heart attacks and meta-analysis reviews of the efficacy and benefits of drug X in the treatment of cardiovascular disorders.

- i. The topic of your thesis should cover a different aspect from what it is already published about drug X.
 - ii. It can be about why drug X is a better treatment than drug Y, the most common treatment for heart attacks or what are the risks associated with the short/ long-term use of drug X in diabetic patients who suffer from cardiovascular disorders.
- 8. The topic is highly controversial and published sources are highly subjective instead of objective.
 - a. A Master's thesis paper is objective and should include objective peer-reviewed supportive data or findings to support your own interpretation (synthesis, analysis and evaluation). It cannot be based on unsubstantiated personal opinions or biases.
 - b. If supportive data is not available, a Master's thesis paper cannot be developed.
 - c. Consider that a controversial topic may require more time to search for objective literature sources and your assignment may be due before your thesis paper is properly researched and developed.

Searching for a Topic

There must be a recent medical discovery or finding about your topic. It cannot re-iterate or summarize information from Wikipedia, online clinical/patient websites, published books or medical/patient pamphlets. When in doubt, your topic should answer **all the three** questions below:

1. Ask yourself: what is new about this topic?
2. What can I or others learn from this topic that it has not been published/overstated before?
3. What is my opinion on this issue?

Websites to search for NEW medical discoveries or findings:

http://www.sciencedaily.com/news/health_medicine/

<http://www.scientificamerican.com/infectious-diseases>

<http://www.breakthroughdigest.com/>

<http://www.medicalnewstoday.com/sections/biology-biochemistry/>

<http://www.discoverymedicine.com/>

You can also search for your topic using medical specialty fields. Click on the following links to begin your search:

1. http://www.mdconsult.com/das/booklist/body/253786866-2?booklist_order=specialty&format=AT
2. Choose a specialty field and search the table of contents

OR

1. Under the search tab, choose Journals or Clinics Reviews Articles and type a topic of interest, then hit search

If you are interested in metabolic disorders, please click on any of the links below:

- <http://www2.niddk.nih.gov/Research/ScientificAreas/Metabolism/IntegrativeMetabolism/NETD.htm>
- <http://www.uptodate.com/contents/overview-of-the-classification-of-inborn-errors-of-metabolism>
- <http://themedicalbiochemistrypage.org/inborn.html>

Skim through references/bibliography sections for published literature that interests you. Write or print published articles that interest you.

Narrowing the Topic

As you search for your topic, you must organize, interpret, evaluate and print/write the results of your search. Your topic can be narrowed down to a specific subject depending on the type of literature sources found during your general topic search. To help you narrow your topic to a specific subject, enter the number of literature sources you have found/collected for each of the categories in the table below.

	Aspect			
Supportive Evidence or Data	Prevention	Management	Diagnosis	Treatment
Numerical Data & Results				
Changes/Regulations				
Discoveries/Improvements				
Current Standard				

Other questions to consider when narrowing your topic are:

- Who is your audience? Who can benefit from this information?
- What are the causes or issues? What are the results? What is useful about this? What is the value/purpose of this paper?
- How does this make a difference? How is it an improvement?

- When does this make a difference?
- Why is this interesting to know? Why is this important? Why is this valuable?

Match each of the four aspects with their corresponding supportive evidence or data on the left column. The pair that has the highest number is your specific subject. Save this table for future reference. This table can provide you with other aspects to study for your thesis paper without changing published references or the topic.

Searching for published sources:

Below are some helpful website links to help you search for peer-reviewed published literature:

- <http://www.ncbi.nlm.nih.gov/sites/pubmedutils/clinical>
- <http://www.ncbi.nlm.nih.gov/nlmcatalog/journals>
- <http://clinicaltrials.gov/>
- http://www.nlm.nih.gov/bsd/special_queries.html
- <http://www.ncbi.nlm.nih.gov/mesh>

Approach to a Master's Thesis Paper

After narrowing the topic, it is important to consider the approach to the thesis paper. The approach defines the specific subject and guides the direction of the content of the thesis paper. It also helps narrow the scope of the literature search. Three functional approaches for a medical thesis paper are:

Approach	Tasks to the Approach	Supportive Evidence Based Data or Facts Needed	Your Own Interpretation
Meta-analysis	<ol style="list-style-type: none">1. Search for clinical trials or laboratory results.2. Develop a hypothesis, problem or statement about laboratory tests or therapeutic treatments.	<ol style="list-style-type: none">1. Articles with numerical data and results from different studies that use the same/similar methods or procedures.2. Data must be complete and free of biases.	<ol style="list-style-type: none">1. Statistical analysis of sets of clinical data and results.2. Reaches a conclusion.3. Defends the conclusion.
Comparison & Contrast	<ol style="list-style-type: none">1. Search for new discoveries or findings in the medical field.2. Focus on one aspect (<i>prevention, diagnosis or treatment</i>) of	<ol style="list-style-type: none">1. Articles about two new discoveries or findings on the chosen aspect.	<ol style="list-style-type: none">1. Determines which of the two new discoveries or findings is better.2. Defends the recommendation.

	a particular disease or condition.		
Clinical-case (PICO)	<ol style="list-style-type: none"> 1. Search the etiology, management, diagnosis and treatment of a particular disease or condition. 2. Focus on one aspect of patient or medical care (management, diagnosis or treatment). 	<ol style="list-style-type: none"> 1. Articles about a new change, improvement or regulation and the current practice or standard on the chosen aspect. 	<ol style="list-style-type: none"> 1. Evaluates why the new improvement is better than the current practice or standard. 2. Defends the recommendation.

Selecting an Approach for your Master's Thesis Paper

Each approach is unique to the type of paper you want to develop. For each approach, you must do a literature review. Literature review is **NOT** a summary of all the published literature collected for the specific subject. Literature review is a tool, not a goal. It is a step in each of the three approaches mentioned above. It contributes to the finished product but by no means constitute a thesis paper. Literature review provides the supporting documentation necessary to make your own interpretation in each approach. Literature review also determines whether the chosen approach can be developed into a thesis paper or another approach should be used on the same topic.

One common misconception is that one can summarize a published literature review article. This is not a thesis paper. Published literature review articles are written by experts in the field. They spend time collecting and referencing multiple published sources. These experts have also put their own analysis and interpretations about a specific subject in their papers. Mimicking published work done by experts does not constitute original work. Claiming this work as your own is plagiarism. To avoid plagiarism, consider the follow questions:

- What is your contribution to this topic?
- What have you contributed that is new?
- What would any reader learn from this?
- How does the literature review support your analysis and interpretation of the topic?
- Can you produce a copy of your annotated bibliography?

If you can answer all these questions, plagiarism is not a problem. If any of the above questions cannot be answered, then look at the purpose, target audience and approach to help define the goal and direction of your thesis paper. If a reference is not in your annotated bibliography, do not use that source for your thesis paper. When in doubt, seek proper guidance from your professors or counselors before you start developing your thesis paper.

At this point, begin to work on the early steps of your Master's thesis paper:

1. Purpose
2. Target audience
3. Approach
4. Search and collection of published peer-reviewed sources
5. Literature review

Developing a Thesis Statement for a Medical Master's Thesis Paper

Once you have selected an approach and collected the published literature sources for your thesis paper, the next step is to write your thesis statement. Before this process can begin, it is important to consider the following questions:

1. Are you interested in the current approach? If not, change the approach for one that meets your interests and the established criteria for writing a medical thesis paper.
2. Is this approach correct for the supporting documentation collected? If not, change to another approach that allows you to use the collected literature without changing the topic.
3. Do you need to consult or collect other peer-reviewed sources to support your approach? If yes, continue with the search and review of collected sources.

If the approach and the collected literature are sufficient to meet all the above requirements, the thesis can be formulated at this point. But, what is a thesis statement? The thesis statement is a “declarative statement”.^[1] It clearly expresses the central idea of your thesis paper in a cause-and-effect relationship. The cause states a problem, hypothesis or aspect of the specific topic to be explored. The effect defends your opinion, stand or conclusion about that specific topic.

What does **NOT** constitute a thesis statement? It is **NOT**:

1. A statement of purpose. Avoid using phrases such as:
 - “The purpose of this paper is....”
 - “This paper is about...”
 - “I will discuss....”
 - This paper will show...”
2. A specific topic, broad topic or title of a thesis paper
 - Lung Cancer
 - Drug X for cardiovascular disease

- The effects of drug X in Patients with Type II Diabetes

3. A question

- How is drug X effective in treating Type II Diabetes?

4. A generic statement. Avoid using phrases such as:

- “It is interesting.....”
- This is important.....”

What constitutes a thesis statement? A thesis statement:

1. **Defines** the scope and direction of your thesis paper.
2. **Helps** you derive an outline for writing the body of the thesis paper.
3. **Connects and consolidates** a group of ideas into a main idea about the specific topic.
4. **Tells** the reader what the thesis paper is about.
5. **Catches** the reader’s interests and attention.

In a thesis statement, the specific topic is the “grammatical subject”. ^[2] The thesis statement can be stated as a single sentence or expanded through multiple sentences. It is normally found in the beginning or the introduction section of your thesis paper.

One major misconception is that the thesis statement cannot be changed once it is written. The thesis statement is written initially as a statement of intent. Expect to apply several revisions and modifications to the thesis statement as you develop the body of the thesis paper. But once your thesis paper is finalized with your conclusions, the thesis statement will summarize your main point of view.

To begin the process of formulating a thesis statement, ask yourself any of the following questions:

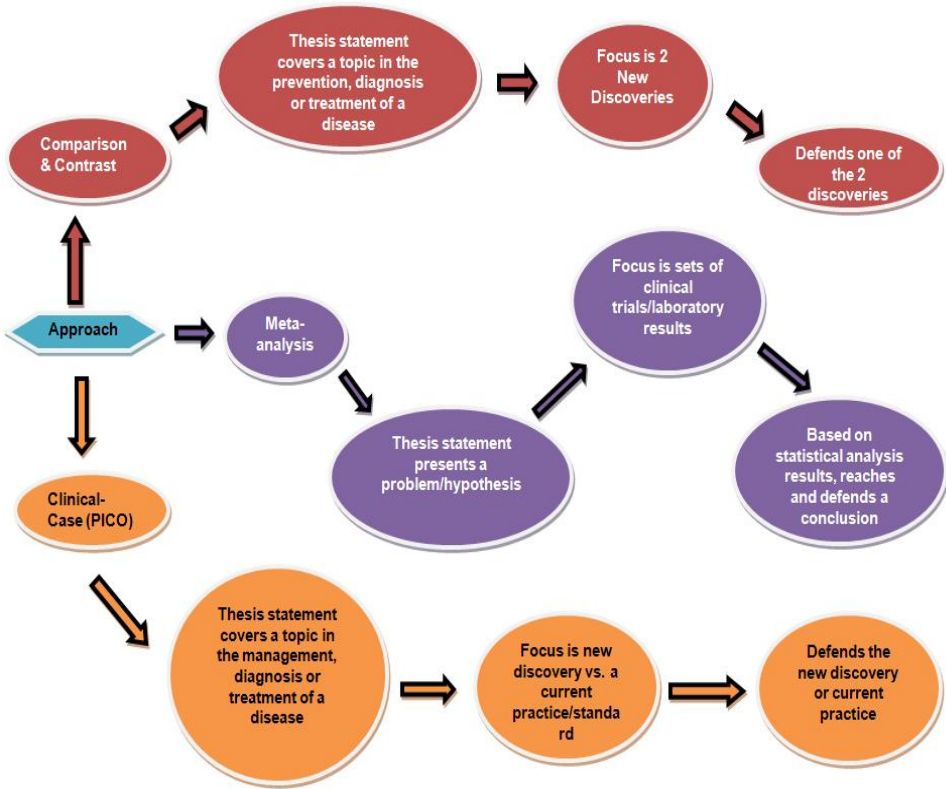
- Who is your target audience? Who else can benefit from this information?

- What are the causes or issues? What are the results? What is useful about this? What is the value/purpose of this paper?
- How does this make a difference? How is it an improvement?
- When does this make a difference?
- Why is this interesting to know? Why is this important? Why is this valuable?
- What is the goal of your thesis paper?

References:

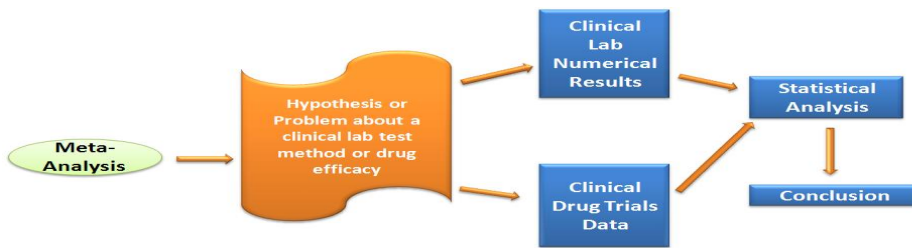
1. eHow. [What Is a Declarative Statement?](#) Retrieved on 2011-08-24
2. Language Study @ Suite101. [The Grammatical Subject Complement in English](#) Retrieved on 2011-08-25

Master's Thesis Paper
Pick an approach

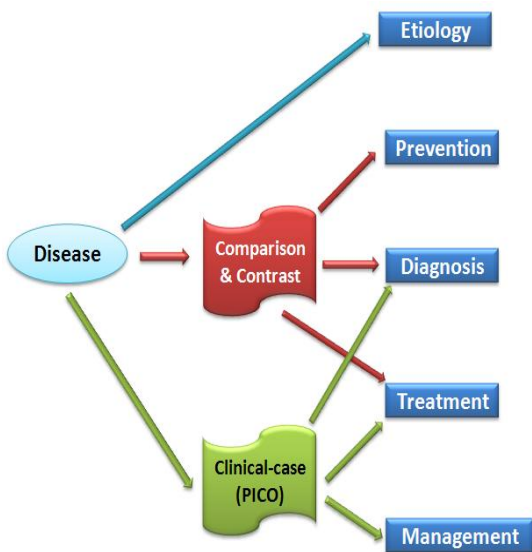


Pick an approach

Meta-analysis



Meta-analysis Tasks



Comparison-Contrast/PICO Tasks

Formal Outline

Begin writing your paper.

A formal outline is important to begin to develop the body of your medical Master's Thesis paper. The formal outline is made up of a list of topics and sub-topics. This list presents your main ideas in a logical sequence. It also shows relationships and connection of the topics and sub-topics to the thesis statement. When you begin writing an essay, use the following formal outline as a guide:

I. INTRODUCTION:

- A. It should include your thesis statement.

II. ETIOLOGY:

- A. Causes
- B. Symptoms
- C. Affected patient population
- D. Frequency/incidence rates
- E. Mortality rates or chances of survival
- F. Risks Factors
- G. Effects of lack of medical intervention

III. PREVENTION:

- A. Lifestyle Changes
 - 1. Diet
 - 2. Physical activity
 - 3. Supplements
- B. Early diagnosis
- C. Risks factors
- D. Cost-effect of managed care
- E. Full function capacity or ability of the patient
- F. Improvement in the patient's quality of life

IV. DIAGNOSIS:

- A. Screening tests
- B. Confirmatory tests
- C. New laboratory tests
- D. Current tests
- E. Accuracy & reliability of the lab tests
- F. Cost-effectiveness of the lab tests

V. TREATMENTS:

- A. Current treatments
- B. New treatments
- C. Clinical trials
- D. Efficacy of the therapy
- E. Therapeutic effect
- F. Risks Factors or side effects
- G. Chances of full recovery or survival

VI. MANAGEMENT:

- A. Patient medical care or rehabilitation
 - 1. Out-patient
 - 2. In-patient
 - 3. Hospice
- B. Prognosis
 - 1. Risks Factors
 - 2. Full or partial recovery
 - 3. Remission rates or chances of survival
- C. Cost of medical intervention

VII. CONCLUSION:

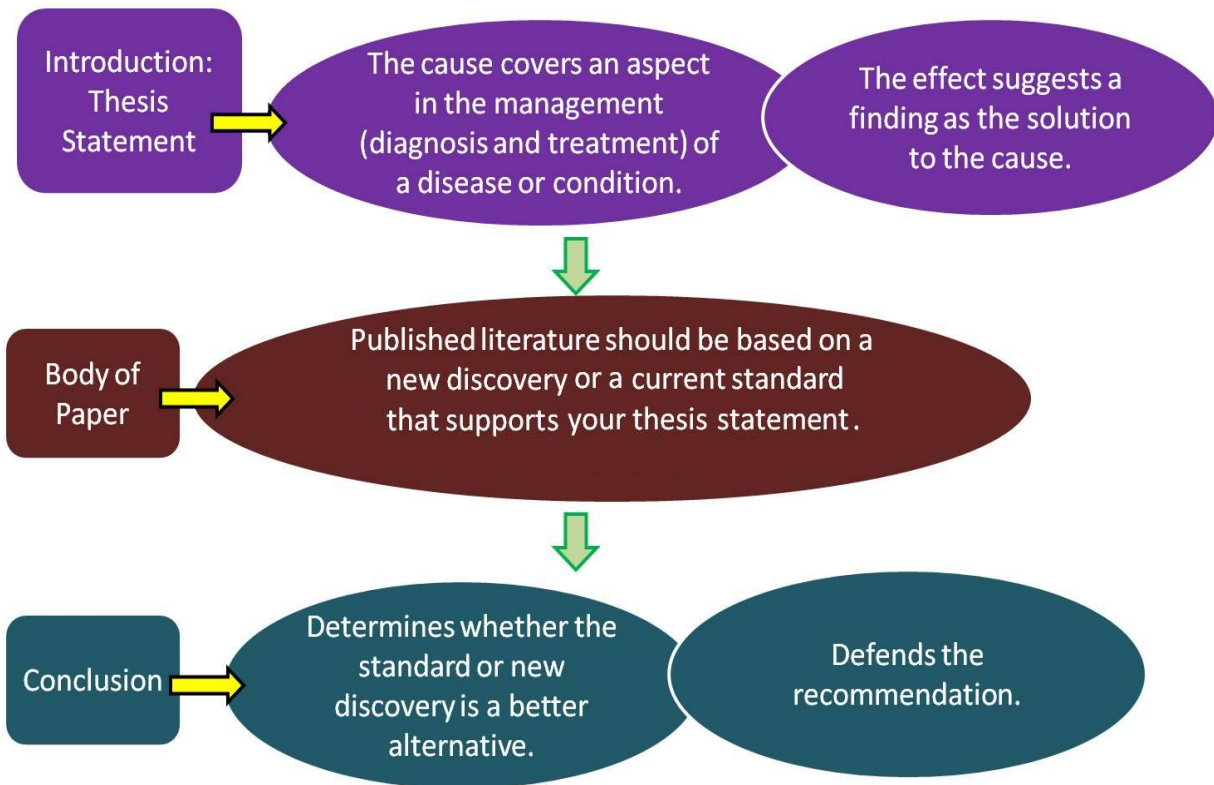
- A. Reconfirm or reword your thesis
- B. Summarize your main points

C. Using your own opinion and words, explain why you have come to this particular conclusion

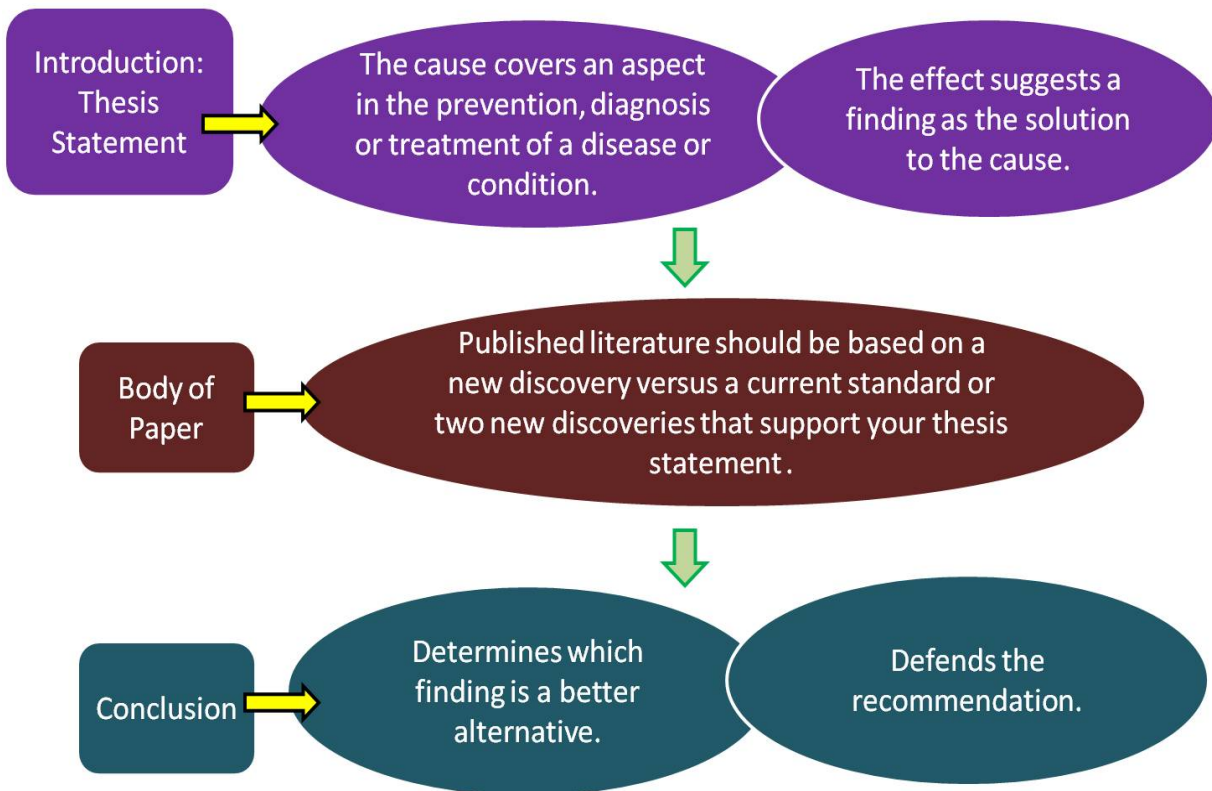
Summary - Master's Thesis Paper

1. **USE THE FORMAL OUTLINE TO BEGIN COLLECTING PUBLISHED SOURCES FOR YOUR PAPER.**
2. **CHOOSE ONE OF THE TWO APPROACHES FOR YOUR PAPER:**

Clinical Case



Comparison & Contrast



FOR THE FIRST ASSIGNMENT:

1. Use the formal outline guide to write the introduction section of your paper.
 - Include your thesis statement in your introduction.
2. In the next section of your paper, write four paragraphs about the etiology of the chosen disease/condition.
 - All paragraphs should be at least four sentences long.
3. Properly cited work should be added at your discretion
4. Follow the check list below to begin editing your draft:
 - a. Is my thesis statement included in the introduction?
 - b. Is the thesis statement concise and clear?

- c. Did I follow my outline?
- d. Are my arguments presented in a logical sequence?
- e. Are all sources properly cited to ensure that I am not plagiarizing?
- f. Have I made my intentions and points clear in the essay?
- g. Did I use third person as much as possible?

- Avoid using phrases such as "I think", "I guess", "I suppose".

- h. Are there any run-on or unfinished sentences?
- i. Are there any unnecessary or repetitious words?
- j. Does one paragraph or idea flow smoothly into the next?
- k. Did I miss anything?
- l. Re-read your paper for grammatical errors.

- Use a dictionary and a thesaurus.
- Do a spell-check.
- Correct all errors that you can spot and improve the overall quality of the paper to the best of your ability.

- 5. Get someone else to read it. Sometimes a second pair of eyes can see mistakes that you missed.

REMAINING ASSIGNMENTS:

Use the following check list, to edit your remaining and final draft assignments:

- 1. Is my thesis statement included in the introduction?
- 2. Is the thesis statement concise and clear?
- 3. Did I follow my outline?
- 4. Are my arguments presented in a logical sequence?
- 5. Have I made my intentions and points clear in the essay?
- 6. Have I proved my thesis with strong supporting arguments?
- 7. Did I miss anything?
- 8. Did I begin each paragraph with a proper topic sentence?
- 9. Have I supported my arguments with documented proof or examples?
- 10. Did I find any run-on or unfinished sentences?
- 11. Did I find any unnecessary or repetitious words?

12. Did I vary sentence lengths?
13. Does one paragraph or idea flow smoothly into the next?
14. Are quotes accurate in source, spelling, and punctuation?
 - Are all sources properly cited to ensure that I am not plagiarizing?
 - Are all my citations accurate and in correct format?
15. Did I avoid using contractions or abbreviations? Use:
 - "cannot" instead of "can't"
 - "do not" instead of "don't"
16. Did I use third person as much as possible? Avoid using phrases such as:
 - "I think"
 - "I guess"
 - "I suppose"
17. Have I made my points clear and interesting but remained objective?
18. Did I leave a sense of completion for my reader(s) at the end of the paper?
19. Re-read your paper for grammatical errors. Are there any spelling or grammatical errors?
 - Use a dictionary and a thesaurus.
 - Do a spell-check.
 - Correct all errors that you can spot and improve the overall quality of the paper to the best of your ability.
20. Get someone else to read it. Sometimes a second pair of eyes can see mistakes that you missed.

***** You may use the library resources to assist you with the proof-reading and published literature searches for your paper. Library staff **WILL NOT** write any of your assignments: statement of purpose, outline, technical content and draft assignments for you. Any questions about the statement of

purpose, outline, technical content and draft assignments for your paper must be addressed directly with your class instructors.